

SCAG 2007/2008 RTP

Draft Preliminary Baseline Forecasts

- Methodology, Assumptions, and Preliminary Results

*Presented to the
Plans & Programs Technical Advisory Committee*

By

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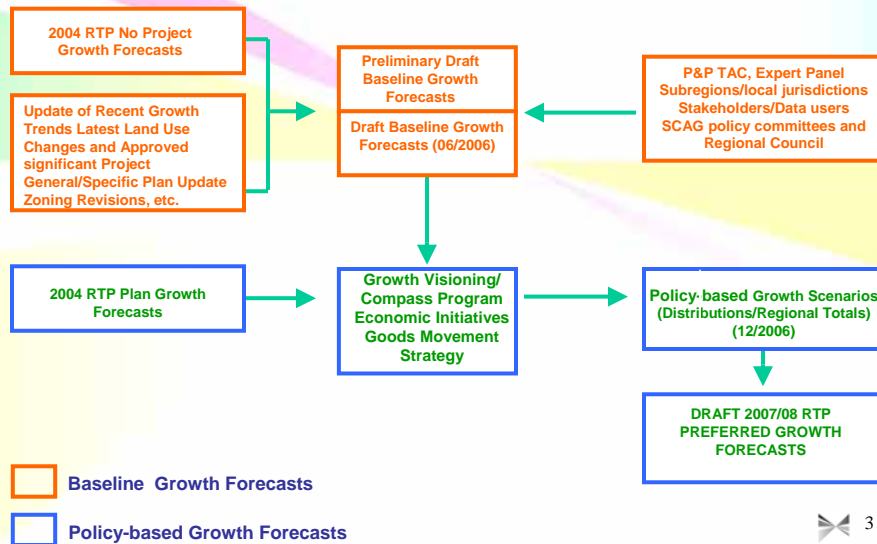
Revised on April 4, 2006

The Definition of “Baseline Forecasts”

**Baseline Growth Forecasts: Technical growth forecasts
without regional policy input**

Specifically, the baseline growth forecasts for 2007/08 RTP will be a result of updating the 2004 RTP no-project growth forecasts with the current demographic and economic trends, the latest land use changes, newly approved regionally significant projects, general plan or specific plan update, and/or zoning revisions.

SCAG 2007/08 RTP GROWTH FORECASTS



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Collaborative Process

- **SCAG Management, Forecasting Staff, and Consultant Team**
- **Plans and Programs Technical Advisory Committee, Panel of Experts**
- **All SCAG Subregions/Jurisdictions**
- **Major Stakeholders/Data Users**
- **RC and Policy Committees**

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Request Plans & Programs TAC's Comments/Input On the Following:

- SCAG's forecasting models/methodology
- Reasonableness of assumptions
- Likely ranges/uncertainties associated with the 30 year long-term forecasts (in 2035) of SCAG region and county level
 - Population,
 - Households, and
 - Employment



Forecasting Accuracy of SCAG Regional Population and Employment Projections

Mean Absolute Percentage Errors				
	Projection Horizon			
	5 year	10 year	15 year	20 year
Population	4%	6%	12%	14%
Employment	8%	11%	14%	14%
Observations	8	7	5	4
Note: Mean Absolute Percentage Errors = Average of (Projected - Estimated) / Estimated *100				
Sources:				
SCAG90 (adopted in 1972)				
D/E 2a (adopted in 1974)				
SCAG, SCAG-76 growth forecast policy, Jan 1976 (adopted in December 1975)				
SCAG, SCAG78 growth forecast policy (adopted in January 1979)				
SCAG, SCAG82 growth forecast policy (adopted in October 1982)				
SCAG, growth management plan (adopted in February 1989)				
SCAG, growth forecast (adopted in June 1994)				
SCAG, growth forecast (adopted in April 1998)				



Requesting Expert Panel Input/Comments on Assumptions re Preliminary Draft Baseline Employment Forecasts

U.S. Projection:

- Census population projection by age
- BLS projection of U.S. economy to 2014
- Labor force participation rates for older age cohorts
 - 55-64
 - 65-74
 - 75 and above
- Labor force participation rates for the rest age cohorts
- U.S. employment/unemployment rates
- U.S. double jobbing rates

SCAG Region Forecasts:

- The self-employment rates
- The region's share of U.S. jobs

SCAG County Forecasts:

- SCAG region county share of regional total employment
- The role of labor force in determining share of job growth by county



Requesting Expert Panel Input/Comments on Assumptions re Preliminary Draft Baseline Population/Household Forecasts

SCAG Regional Population/Household Forecasts (2005-2035)

- Fertility rate
- Mortality rate
- Net migration (domestic in-migration rate, domestic out-migration rate, international net migration)
- Labor force participation rate
- Double jobbing rate to determine labor force demand
- Headship rate

SCAG County Population/Household Forecasts (2005-2035)

- Fertility rate
- Mortality rate
- Net migration (domestic in-migration rate, domestic out-migration rate, international net migration)
- Labor Force Participation Rate
- Headship Rate

Linkage of Regional Forecasts and County Forecasts

Use of RTP 2004 RTP No Project Forecasts (Input) for developing net migration



Baseline Forecasts Are Inputs to Regional Planning

- **Transportation Planning**
- **Air Quality Planning**
- **Housing**
- **Airport Planning**
- **Water Planning**
- **Education, Land Use and Other Local Planning**



Baseline Forecasts Serve as Focal Points for Major Policy Discussions and Policy-based Forecasts

- **Growth Visioning/Land use**
- **Housing Needs and Policy**
- **Transportation/Infrastructure Investments**
- **Environmental Justice**
- **Labor force/Education/Training**
- **Globalization/Economic Competitiveness**



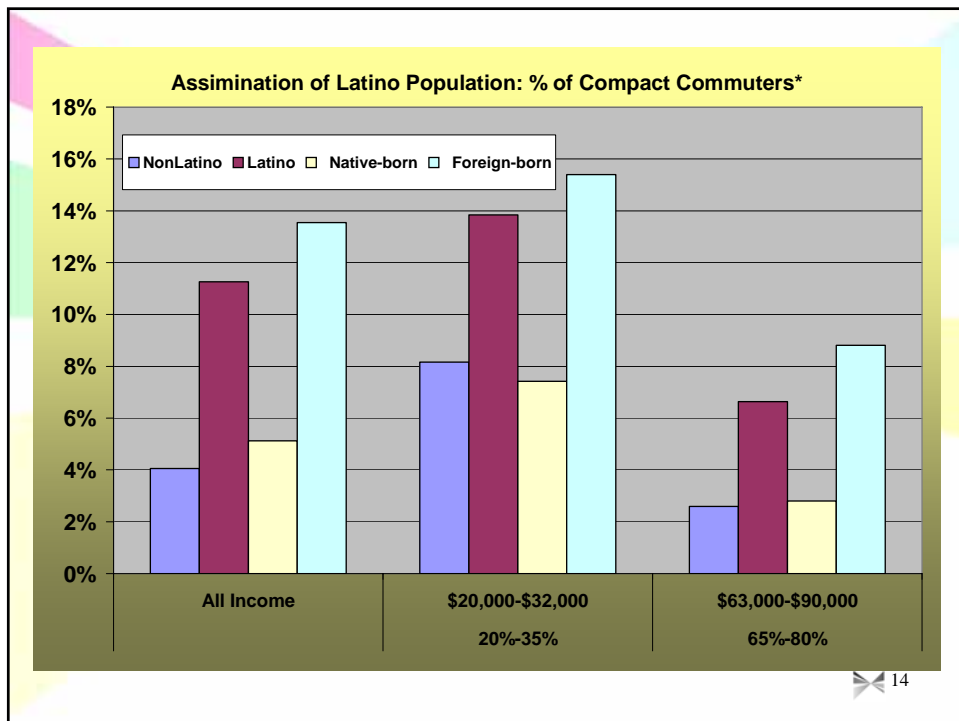
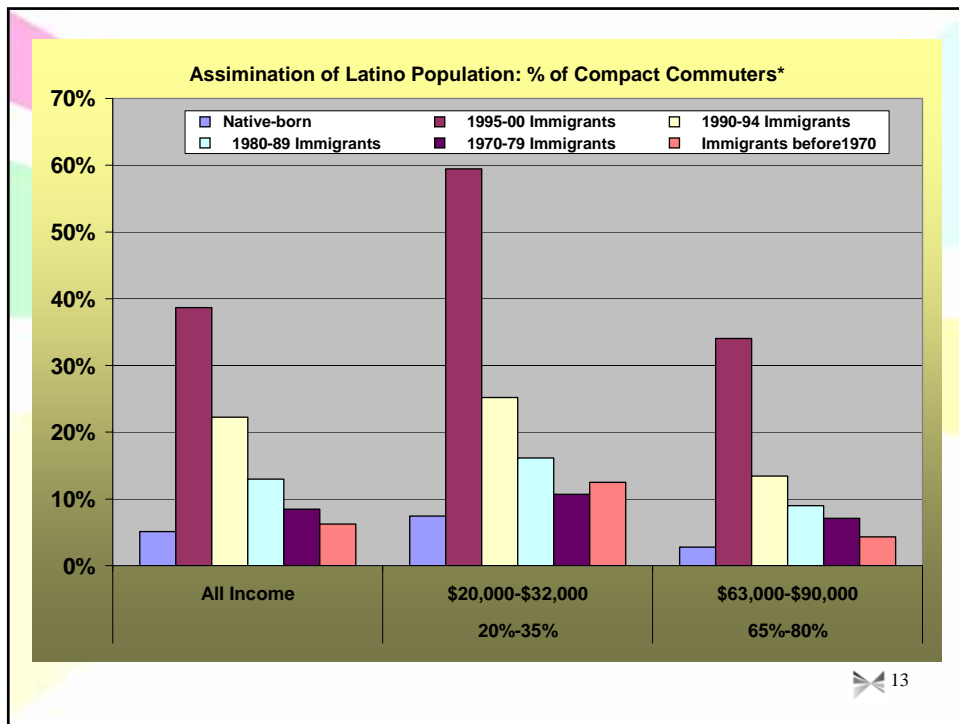
Provide Basis for Envision the Changes in 30 Years

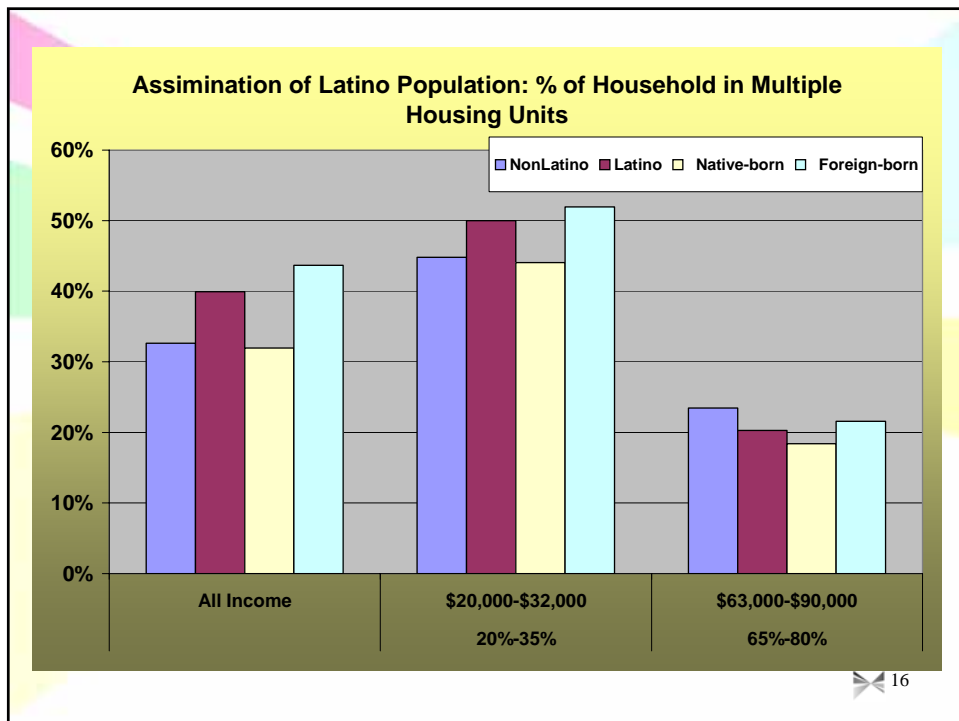
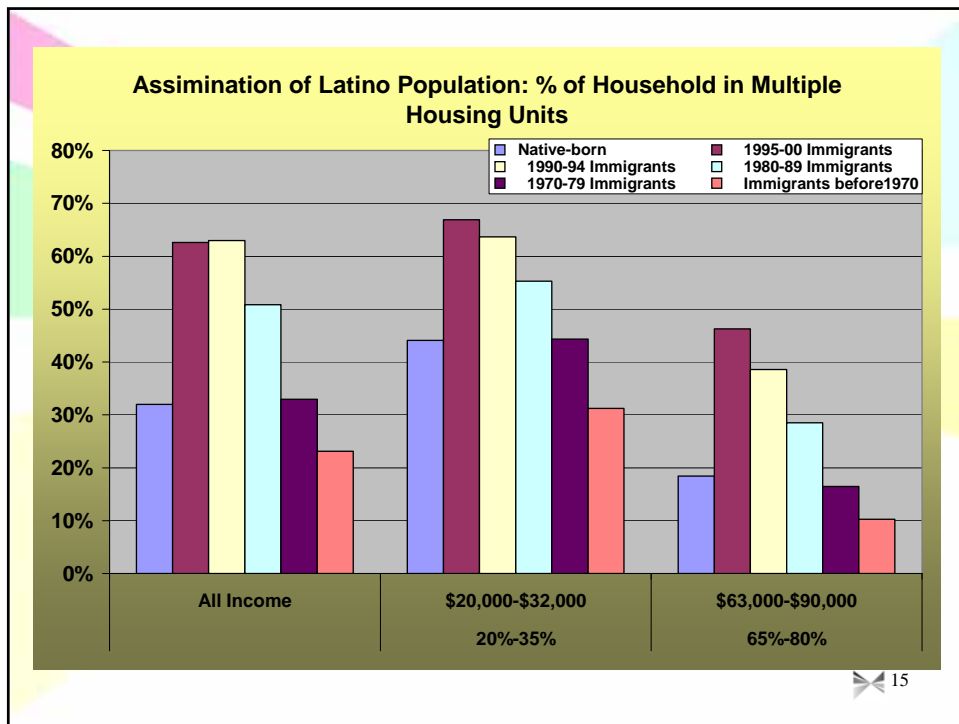
- Changes in trends
- Changes in age structure
- Changes in ethnicity/nativity
- Changes in behaviors associated with age/ethnicity/nativity
- Implications to the regional planning



Key Indicators of Compact-city Lifestyle in SCAG Region, 1980, 1990, and 2000									
2000 Census PUMS									
Household Income Distribution	Household Size = Population / Household			% of Household in Multiple Housing Units			% of Compact Commuters*		
	All Income	20%-35%	65%-80%	All Income	20%-35%	65%-80%	All Income	20%-35%	65%-80%
Household Income Range		\$20,000-\$32,000	\$63,000-\$90,000		\$20,000-\$32,000	\$63,000-\$90,000		\$20,000-\$32,000	\$63,000-\$90,000
NonLatino	2.46	2.12	2.79	32.6%	44.8%	23.5%	4.1%	8.2%	2.8%
Latino	3.96	3.82	4.53	40.0%	50.0%	20.3%	11.3%	13.8%	6.6%
Native-born	3.00	2.80	3.32	32.0%	44.1%	18.4%	5.1%	7.4%	2.8%
Foreign-born	4.41	4.15	5.35	43.7%	52.0%	21.6%	13.5%	15.4%	8.8%
1995-00 Immigrants	4.61	4.02	6.59	62.6%	66.9%	46.3%	38.7%	59.5%	34.1%
1990-94 Immigrants	4.26	4.33	5.18	62.9%	63.7%	38.6%	22.3%	25.2%	13.4%
1980-89 Immigrants	4.52	4.27	5.56	50.8%	55.3%	28.5%	13.0%	16.1%	9.0%
1970-79 Immigrants	4.62	4.27	5.43	32.9%	44.3%	16.5%	8.5%	10.7%	7.1%
Immigrants before 1970	3.85	3.37	4.73	23.1%	31.2%	10.2%	6.2%	12.5%	4.3%
All Household	2.90	2.78	3.22	34.8%	46.8%	22.7%	6.7%	10.9%	3.8%
1990 Census PUMS									
Household Income Distribution	Household Size = Population / Household			% of Household in Multiple Housing Units			% of Compact Commuters*		
	All Income	20%-35%	65%-80%	All Income	20%-35%	65%-80%	All Income	20%-35%	65%-80%
Household Income Range		\$15,000-\$25,000	\$50,000-\$67,000		\$15,000-\$25,000	\$50,000-\$67,000		\$15,000-\$25,000	\$50,000-\$67,000
NonLatino	2.46	2.10	2.79	32.7%	46.4%	23.1%	4.1%	8.3%	2.3%
Latino	3.90	3.74	4.41	41.5%	51.8%	22.9%	13.3%	16.0%	10.2%
Native-born	3.13	2.80	3.55	29.2%	39.8%	13.9%	4.9%	7.5%	3.9%
Foreign-born	4.33	4.12	5.13	48.4%	56.7%	30.6%	16.6%	17.9%	14.0%
1985-90 Immigrants	4.51	4.25	5.77	70.5%	75.1%	55.4%	32.4%	34.8%	36.8%
1980-84 Immigrants	4.21	4.02	5.33	62.9%	67.9%	43.3%	21.3%	21.4%	23.8%
1970-79 Immigrants	4.66	4.37	5.36	46.4%	53.1%	34.6%	13.0%	12.7%	9.9%
Immigrants before 1970	3.90	3.64	4.62	27.0%	35.1%	13.3%	6.9%	10.4%	5.2%
All Household	2.79	2.60	3.09	34.7%	48.1%	23.0%	7.0%	12.0%	4.3%
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Household Income Range		\$8,000-\$13,000	\$25,000-\$33,000		\$8,000-\$13,000	\$25,000-\$33,000		\$8,000-\$13,000	\$25,000-\$33,000
NonLatino	2.43	2.06	2.79	34.5%	48.7%	24.0%	5.7%	11.3%	4.4%
Latino	3.54	3.45	4.03	40.6%	51.0%	25.4%	11.8%	19.7%	6.8%
Native-born	3.20	3.02	3.56	32.2%	43.5%	20.7%	6.8%	11.9%	4.1%
Foreign-born	3.84	3.71	4.66	47.8%	55.6%	31.6%	15.5%	22.9%	10.1%
1975-80 Immigrants	3.90	3.76	5.51	65.7%	71.1%	48.5%	26.4%	25.3%	21.6%
1970-74 Immigrants	4.07	4.04	4.74	53.1%	57.2%	44.7%	17.4%	18.3%	13.4%
1960-69 Immigrants	3.94	3.79	4.56	43.4%	49.8%	29.8%	10.9%	16.3%	3.5%
Immigrants before 1960	3.37	2.96	4.24	29.9%	38.6%	14.0%	6.6%	5.4%	5.6%
All Household	2.62	2.36	2.98	35.6%	49.2%	24.2%	7.1%	13.1%	4.8%
Note: * Commuters by public Transit, bicycle, or walking.									
Source: SCAG staff Hsi-Hwa Hu processes Public Use Microdata Samples U.S. Census Bureau, 1980, 1990, and 2000.									







Analytical Framework for SCAG Long-Term Regional Forecasts

Employment/Job

- Up to 2014: Shift-Share method, based on detailed BLS projection by NAICS and projected share by SCAG region industry
- From 2015 to 2035: U.S. jobs based on Population and labor force/workers and jobs relationship and region based on projected share of U.S. jobs

Population/Households

- Cohort component model (birth, death, domestic and international migration)
- Headship rates by age, gender, and ethnicity

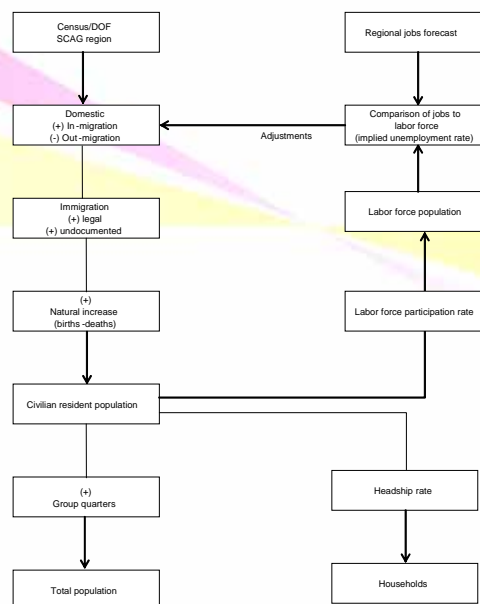
Reconcile Job/Population Projections

- Implied unemployment rates and regional labor force analysis



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Regional Baseline Population/Household Forecasts and Linkages to Employment Forecasts



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Employment Forecasts

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Basic Framework

Top-Down: U.S. – SCAG - County

Same Methodology as Used in Previous RTP Growth Forecasts

Historical Data (1990-2005)*	Short-Term (2006-2014)	Long-Term (2015-2035)
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U.S.

BLS 2014 Projection

Census Population To
Labor Force/Employment

SCAG

SCAG/US Shift-Share Model

Counties

County/SCAG Shift-Share models

* Much shorter historical data than previous forecasts due to newly implemented NAICS-based employment data series. Include EDD 2005 Benchmark Revisions (march 3, 2006)

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U.S. Employment Projection

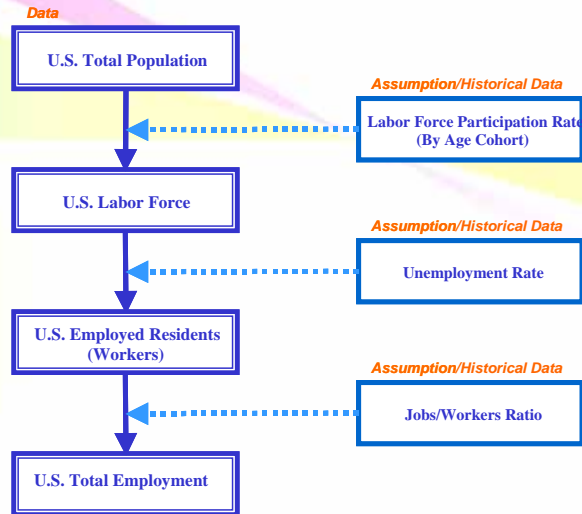
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U.S. Employment Projection **BLS Projection to 2014**

- Bureau of Labor Statistics (BLS) released 2004-2014 U.S. employment projection in Nov. 2005.
- Over the 2004-14 decade, total employment is projected to increase by 19 million jobs, or 13 percent.
- SCAG used 2010 BLS projection for 2004 RTP. The 2014 BLS employment is about 3 million lower than 2010 BLS estimate. Employment growth for next 10 years is expected to be slower than early estimate from BLS.

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U.S. Employment Projection U.S. Employment Projection 2015-2035



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U.S. Employment Projection 2015-2035

Formula

$$LF_{(A,Y)} = POP_{(A,Y)} \times LFPR_{(A,Y)}$$

$$LF_{(Y)} = \sum_A LF_{(A,Y)}$$

$$WKER_{(Y)} = LF_{(Y)} \times (1 - UE.Rate_{(Y)})$$

$$EMPL_{(Y)} = WKER_{(Y)} \times (Jobs/Workers Ratio)$$

Y: Years
A: Age Cohorts
LF: Labor Force
POP: Population

WKER: Worker
UE.Rate: Unemployment Rate
EMPL: Employment
LFPR: Labor Force Participation Rate

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U.S. Employment Projection 2015-2035

Data & Assumptions

Data:

- U.S. Census Bureau Population Projection to 2035
- U.S. BLS Labor Force Participation Rates to 2014

Assumptions:

- Increase Labor Force Participation Rates for Three Older Cohorts (55-64, 65-74, and 75+)
- Unemployment Rates
 - Average of Past 10 Years (1995-2005) = 5.17%
- Jobs/workers Ratio: 1.053
 - Based on Multiple Jobholding Rate (Double Jobbing Rate)
 - Use Jan. 2006 BLS Data = 5.3%



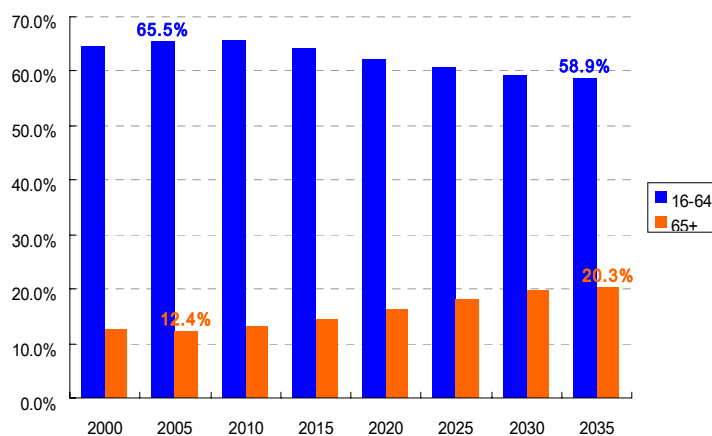
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U.S. Employment Projection 2015-2035

U.S. Population Trends

Population Aging:

The share of population ages between 16 and 64 continues to decline to 2035.



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U.S. Labor Force Participation Rates

- Recent historical trends show sharp turnaround in participation for older workers
- Better health/longer life expectancy should allow longer work lives
- Move toward information versus manual skills should facilitate longer work lives

Assumptions:

- Hold BLS 2014 labor force participation rates (LFPR) constant to 2035 for population age groups below 55
- Raise LFPR for age groups 55 and older between 2014 and 2030, based on half of the growth rates between 2004 and 2014 projected by the BLS



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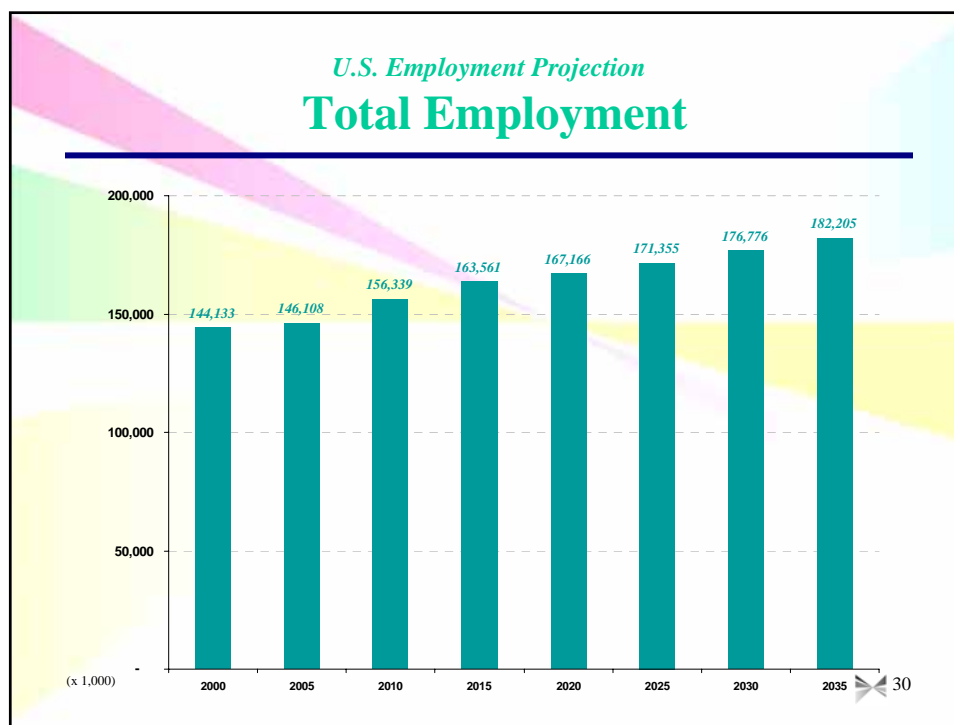
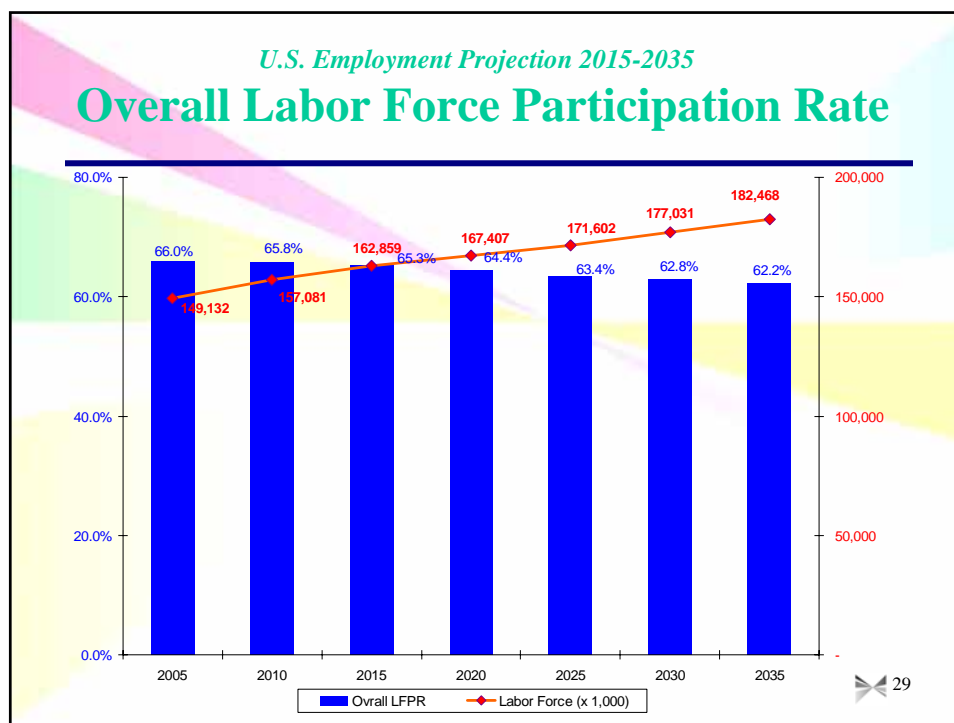
U.S. Labor Force Participation Rates

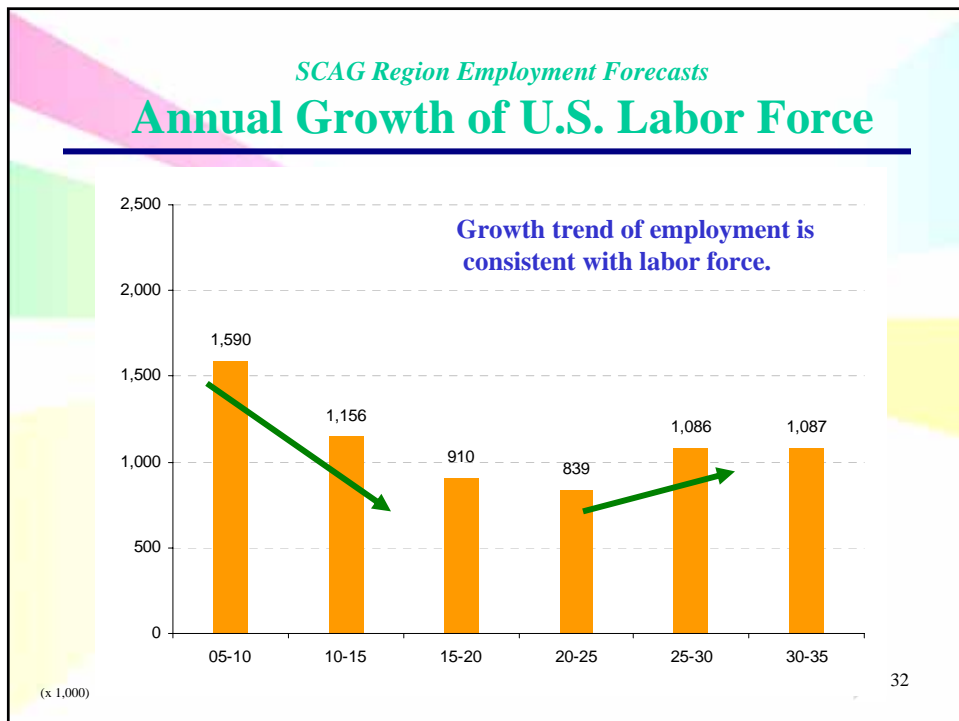
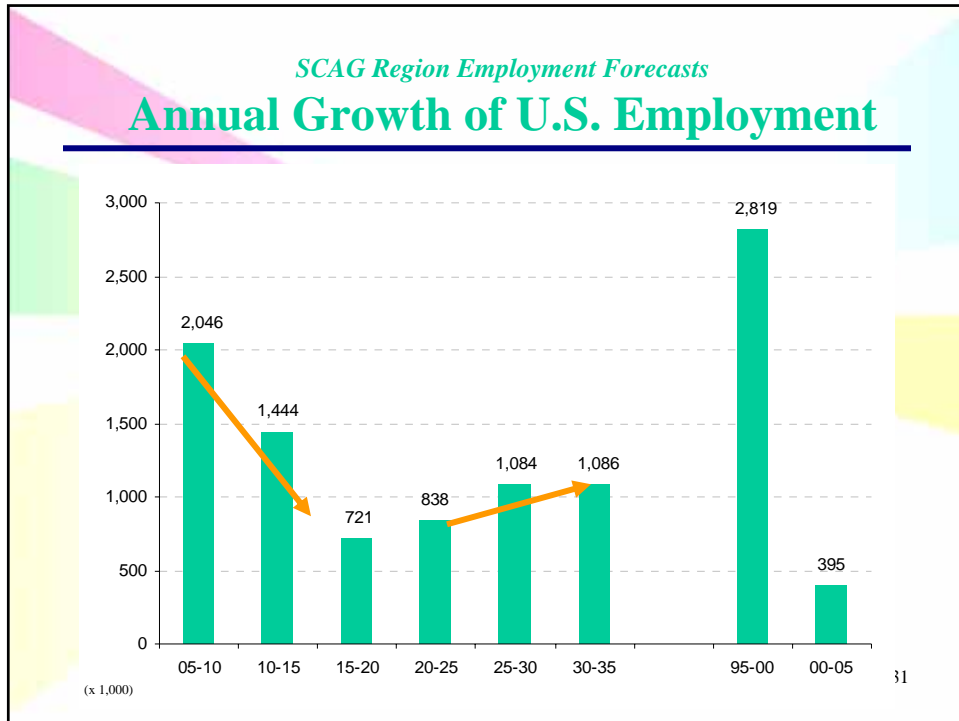
- 2014 BLS projection increased LFPR for older cohorts.
- 2030 overall LFPR for 2008 RTP is 1.5% lower than 2004 RTP, which is consistent with BLS projection.

Age Cohort	BLS 2000-2010		2004 RTP Assumption	BLS 2004-2014		2008 RTP Assumption	
	2000	2010	2030	2004	2014	2030	2035
16 to 24	65.9%	66.5%	67.4%	61.1%	59.1%	59.1%	59.1%
25 to 34	84.6%	87.1%	88.1%	82.7%	85.4%	85.4%	85.4%
35 to 44	84.8%	86.0%	86.2%	83.6%	83.0%	83.0%	83.0%
45 to 54	82.6%	83.8%	83.3%	81.8%	82.3%	82.3%	82.3%
55 to 64	59.2%	60.9%	62.7%	62.3%	65.2%	67.3%	67.3%
65 to 74	19.1%	22.1%	31.7%	21.9%	26.9%	30.7%	30.7%
75 and over	5.3%	5.5%	8.0%	6.1%	9.6%	12.2%	12.2%
Overall LFPR	67.2%	67.5%	64.3%	66.0%	65.6%	62.8%	62.2%



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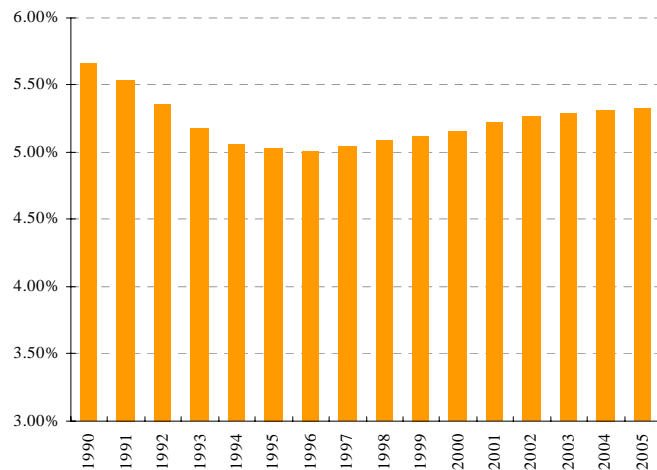


SCAG Region Employment Forecasts

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SCAG Region Employment Forecasts SCAG Region Job Share of the U.S.

SCAG Region share of U.S. jobs rose after 1995.



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Methodology

Short-Term Projection to 2014: Shift-Share Model

- By 20 NAICS (North American Industry Classification System) Industries
- Six Industry Projection Methods:
 - Change in Share
 - Average Share
 - Pop Growth
 - Increment (Share of Growth)
 - Constant 2005 Share
 - Simple Regression
- Choose the best share method based on statistical test.

Long-Term Projection 2015-2035: Shift-Share Model

- Use historical data (1990-2005) & short-term forecast results (2005-2014) for SCAG region.
- Calculate SCAG share of the U.S. employment to 2035.



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Data & Assumptions

U.S. Employment

- 1990-2014 (20 Industries from BLS); 2015-2035 (Total employment derived from population/labor force)

SCAG Region

Wage & Salary Employment

- California EDD 2005 Benchmark: 1990-2005

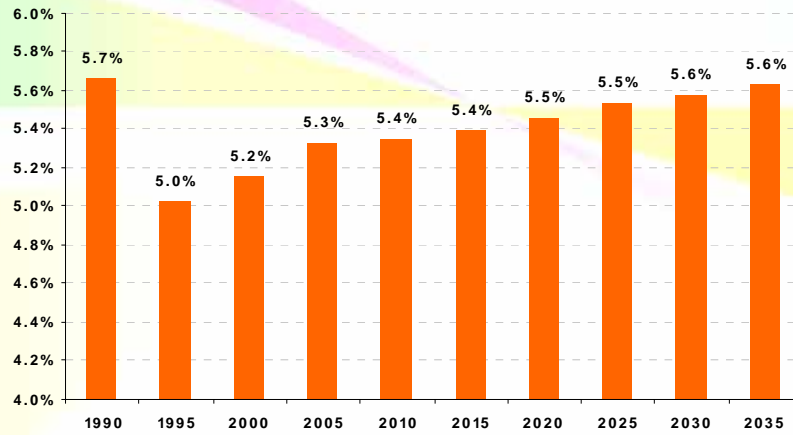
Self-employment Rate:

- Share of Self-employment to Total Employment
- Calculated Based on 2000 Census PUMS (Public Use Microdata Samples) and CPS (Current Population Survey) Data
- 2004 SCAG Region self-employment rate is 8.4% (7.3% for the U.S. – from BLS data)



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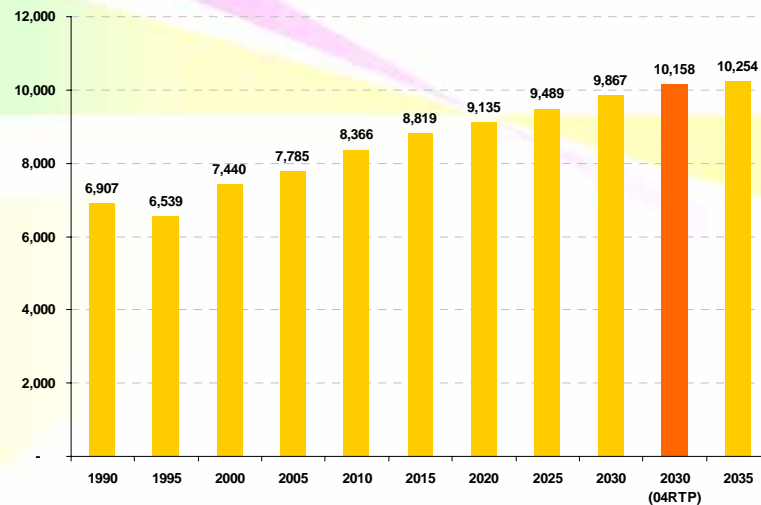
SCAG Region Employment Forecasts SCAG/U.S Job Share



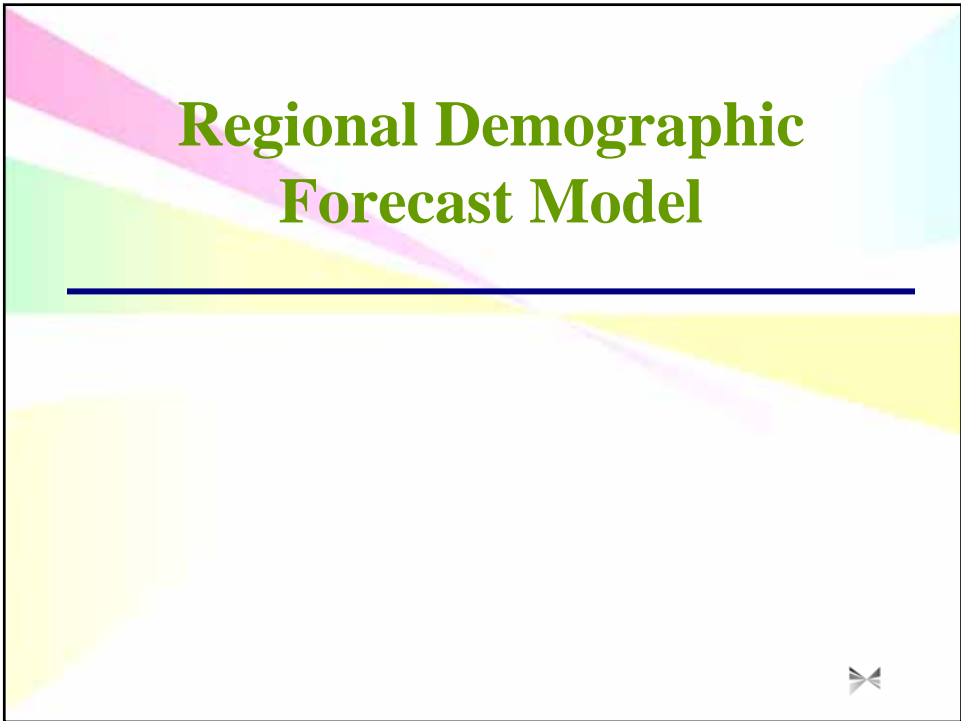
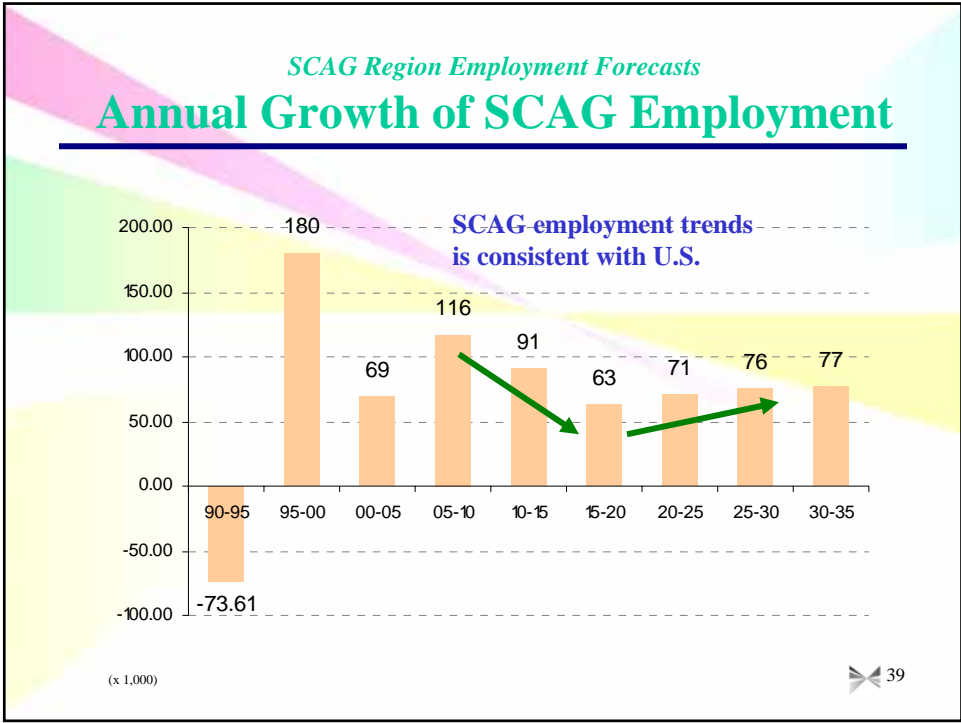
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SCAG Region Employment Forecasts SCAG Job Forecast

Current job estimates for SCAG region is 290K lower than 2004 RTP (2.9%).



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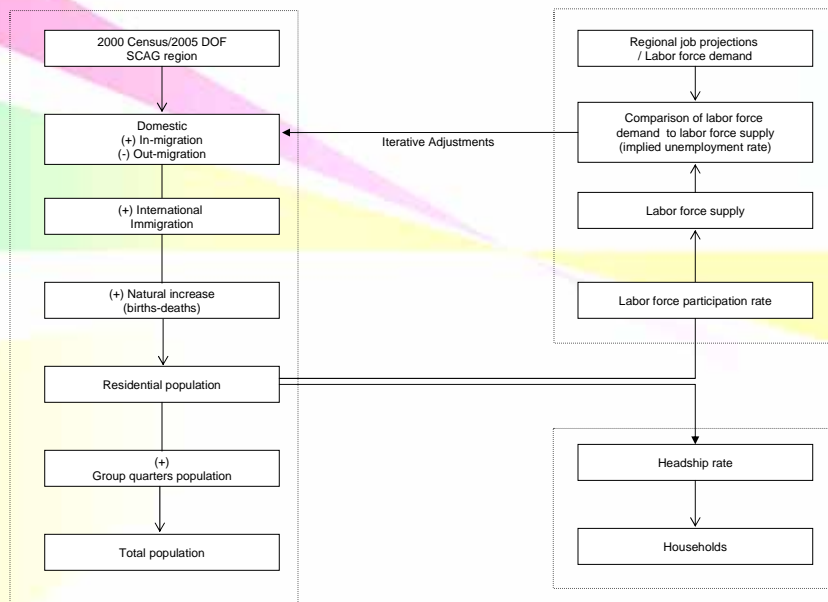


Regional Demographic Forecast Model: Methodologies

- *Economic-Demographic Forecast Method* (cohort-component method + employment projection)
 - Components of population change: fertility, mortality, domestic in- migration, domestic outmigration, net immigration
 - Balance labor force supply derived from cohort component method and labor force demand derived from employment projection
- *Headship Rate Method*
 - Headship Rate = (household head / population) by age, gender, and race/ethnicity

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Regional Demographic Forecast Process



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Recent Trends and Demographic Assumptions Update

- Recent population and household trends (California Department of Finance)
- U.S. Census Bureau released *interim projections of the U.S. population by age, sex, race, and Hispanic origin* in March 2004.
- U.S. Census Bureau released *interim projections of the California population by age, sex, race, and Hispanic origin* in April 2005.
- California Department of Finance released *population projections by race/ethnicity for California and its Counties 2000–2050* in May 2004.



Key Regional Demographic Assumptions

- **Demographic Assumptions**
 - Fertility: **Declines**
 - Mortality: **Declines**
 - Net Immigration: **Constant**
 - Net Domestic Migration: **Fluctuates**
 - Household Headship Rates: **Declines**
- **Additional Regional Assumptions**
 - Jobs Per Worker: **1.0452**
 - Unemployment Rate: **5%-7%**
 - Total Labor Force Participation Rate: **Declines**



Regional Demographic Assumptions: Fertility

- NH White [1.6 TFR], NH Black [1.7 TFR],
NH Asian & Others [1.4 TFR]
 - o Lower than U.S. trends
 - o 2000-2005 total fertility rates *kept constant* to 2035
- Hispanic [2.5 TFR]
 - o Lower than U.S. trends
 - o 2000-2005 total fertility rates *decline* following the projected rate changes of U.S. projected middle series and interim projections



Regional Demographic Assumptions: Fertility Rates by Race/Ethnicity

	2000-05	2030-35
White (NH)	1.6	1.6
Black (NH)	1.7	1.7
Asian & Others (NH)	1.4 (2.0*)	1.4 (2.0*)
Hispanic	2.5 (2.8*)	2.3 (2.5*)
Total	2.1	2.0



Regional Demographic Assumptions: Mortality

- Life expectancy at birth *improves at the same rate* as that of the national life expectancy improvement as determined by the US Census Bureau Middle-Series Projection and interim projections during the projection horizon.
- Life expectancy at birth

	2000	2035
Male	74.8	79.7
Female	80.5	85.4



Regional Demographic Assumptions: Migration

- Domestic migration is influenced by *labor demand*, derived from regional employment forecasts.
- International net immigration is determined using the annual average (125,000) of international net immigration (1990-2005).



Domestic In-Migration Assumptions

- Age/Gender Distribution: 1995-2000 Domestic In-migrants (2000 Census)
- Race/Ethnic distribution of domestic in-migration

	1995-2000	2030-35
White (NH)	55%	33%
Black (NH)	8%	8%
Asian & Others (NH)	16%	22%
Hispanic	21%	38%
Total	100%	100%



Domestic Out-Migration Assumptions

- Age/Gender Distribution: 1995-2000 Domestic Out-migrants (2000 Census)
- Race/Ethnic distribution of domestic out-migration

	1995-2000	2030-35
White (NH)	48%	35%
Black (NH)	7%	7%
Asian & Others (NH)	13%	16%
Hispanic	31%	43%
Total	100%	100%



Net Immigration Assumptions

- Age/Gender Distribution: 1995-2000 Net Immigrants (2000 Census)
- Race/Ethnic distribution of net immigration (2000 Census and 2005 Pew Hispanic Center Report)

	2000-05	2030-35
White (NH)	11%	10%
Black (NH)	3%	3%
Asian & Others (NH)	19%	19%
Hispanic	68%	68%
Total	100%	100%



Regional Demographic Assumptions: Labor Force Participation

- Labor force participation rates by race/ethnicity

	2005	2035
White (NH)	64%	58%
Black (NH)	59%	56%
Asian & Others (NH)	62%	58%
Hispanic	61%	58%
Total	62%	58%



Comparison of Demographic Indicators: 2004 RTP No Project vs. Preliminary 2008 RTP

	2004 RTP No Project	Preliminary 2008 RTP
Total Fertility Rate (2025-30)	2.1	2.0
Crude Death Rate (2025-30)	7.5	7.5
% Nat Increase (05-30)	86%	81%
Labor Force Participation Rate (2030)	61%	59%
Persons* per Household (2030)	3.06	3.11



Regional Population as Proportion of State Population

	2005	2035
Preliminary 2008 RTP	49%	48%
CA DOF (2004)	49%	45%

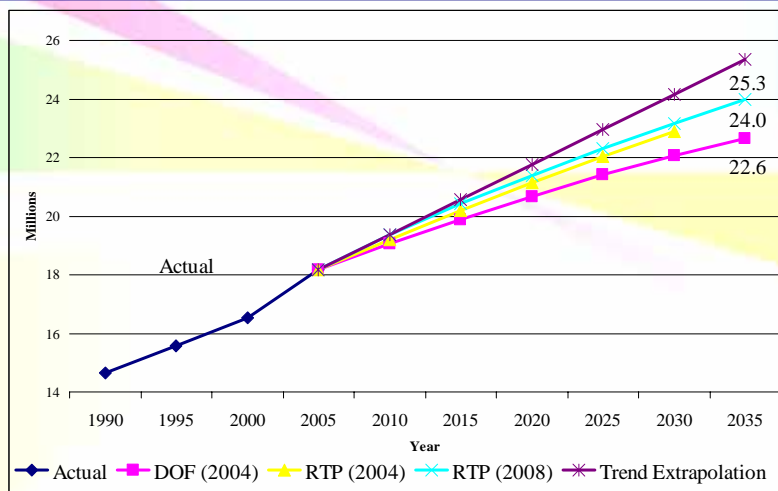


Comparison of 2004 RTP No Project Forecasts and Preliminary 2008 RTP Forecasts

	2004 RTP No Project (2030)	Preliminary 2008 RTP (2030)
Population	22.9 mil.	23.2 mil.
Households	7.5 mil.	7.5 mil.
Persons* Per Household	3.06	3.11



SCAG Region Population Forecasts: Alternatives



Regional Demographic Assumptions: Household Headship Rates

- Historical trends of general household headship rates (46.7% (1980), 43.7% (1990), 43.1% (2000))
- Historical trends of female household headship rates. (26.6% (1980), 27% (1990), 28.5% (2000))
- Assimilation assumption of Asian rates (reduce 50% difference from 2000 Census White headship rates) & Hispanic rates (reduce 25% difference from 2000 Census White headship rates)

	2005	2035
White (NH)	49%	49%
Black (NH)	47%	49%
Asian & Others (NH)	38%	41%
Hispanic	34%	36%
Total	41.4%	41.0%



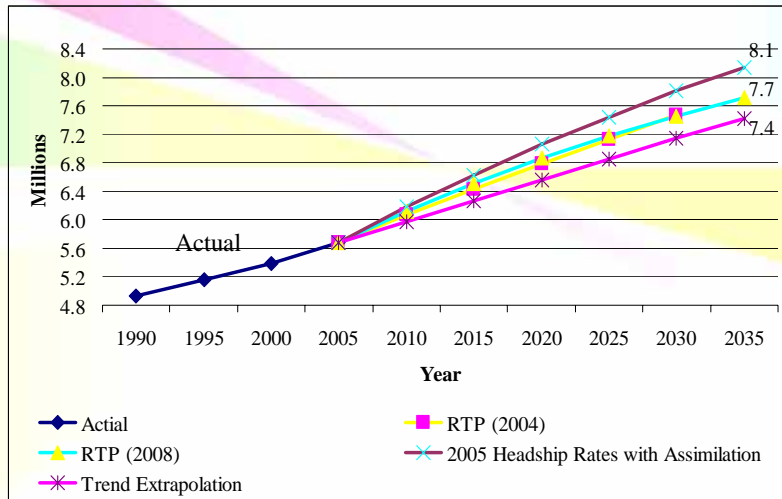
Regional Demographic Assumptions: Persons* Per Household

	2005	2035
White (NH)	2.4	2.4
Black (NH)	2.9	2.5
Asian & Others (NH)	3.3	2.9
Hispanic	4.2	3.6
Total	3.1	3.0

Note: * residential (household) population



SCAG Region Household Forecasts: Alternatives



Thank You

Questions? Discussions? Comments?